



**Department of Public Works
Eric W. Larson – City Engineer**

Karen Tingle-Sames, Mayor

City Council Members

Don Hawkins	Mark Showalter
David Lusby	Connie Tackett
Kelly McEuen	John Travis
Larry Prather	Chad Wallace

INVITATION TO BID

ADVERTISEMENT FOR PAPER

The City of Georgetown will receive sealed bids for the 2010-2011 Crack Sealing and Pilot Microsurfacing Program until 2:30 p.m., December 6, 2010, at the City Clerk's Office, 100 N. Court Street, Georgetown, KY 40324. Bids will be opened immediately following. The City reserves the right to accept or reject any and all bids and waive formalities. Bid Packages and Specifications may be picked up at the City Clerk's Office, Monday through Friday, 8:00 a.m. to 4:00 p.m. or the Department of Public Works, 235 West Yusen Way, Georgetown, KY 40324 from 8:00 a.m. to 3:30 p.m.

Run Date(s): Saturday, November 13, 2010

BID PACKAGE

Bids will include Equipment, Labor, and Materials to complete the item of work. The City will award the contract on a price per unit basis to the lowest and best qualified bidder.

NOTE: The Microsurfacing projects listed are classified as a Pilot project. Every attempt to develop a comprehensive specification has been made. However, contractors are encouraged to bid based on the attached specification and submit questions and/or alternatives to the specifications prior to bidding for consideration.

NOTE: Crack sealing projects listed are based on recommendations from the database of inventoried assessment and have not been fully field verified. Contractors are encouraged to bid based on the attached project descriptions and submit questions and/or alternatives to the listed roadways prior to bidding for consideration.

See attached SPECIFICATIONS AND PROGRAM QUANTITIES for project details.

Bids will also include:

- 1) All materials must be produced by a Kentucky Transportation Cabinet pre-qualified supplier,
- 2) All materials must be produced according to the current edition of the Kentucky Transportation Cabinet's Standard Specification for Road and Bridge Construction,
- 3) 48 hour notification of adjacent property owners and on-street parked vehicles prior to work,
- 4) Cleaning of Area to be sealed,



- 5) Clean up after sealing,
- 6) Preparation of asphalt surface for microsurface application,
- 7) All traffic control,
- 8) Clean up after microsurfacing,
- 9) All work must be performed by a Kentucky Transportation Cabinet pre-qualified contractor,
- 10) All work must be performed according to the current edition of the Kentucky Transportation Cabinet's Standard Specification for Road and Bridge Construction,
- 11) The City reserves the right to accept or reject any and all bids in the best interest of the City of Georgetown,
- 12) Bids must be submitted before the bid deadline and on the attached BID FORM with all items included in order for the bid to be considered,
- 13) Bids must include a 5% Bid Bond, in the form of a Surety or Certified / Cashier's Check. Checks written from business or personal accounts will not be acceptable,
- 14) The selected contractor will be required to provide a certificate of liability and worker's compensation insurance and Performance and Payment Bonds in an amount of the contract,
- 15) Prevailing wage rates do not apply to this project.
- 16) The selected Contractor will be required to sign a standard agreement for goods and services with the City within 14 days of Notice of Award. A Notice to Proceed will be issued once the agreement has been signed by both parties and all required paperwork herein described is received by the City,
- 17) Contractor shall comply with local ordinances and may be required to obtain a business license from the Georgetown – Scott County Revenue Commission,
- 18) Contract will include provisions per unit price adjustment based on the published Kentucky Transportation Cabinet asphalt price index.
- 19) The contractor will obtain all permits needed to complete the work,
- 20) No bidder may withdraw a bid within 90 days after the actual date of the bid opening,
- 21) Contractor shall warrant goods and services, including materials/parts and labor for a period of one (1) year after installation,
- 22) Erosion Control shall be used if deemed necessary to protect the site within the accepted standards of care for this type of work.
- 23) The work shall be completed by June 30, 2011

Further information may be obtained from Eric W. Larson, PE, CFM, AICP, City Engineer, Department of Public Works.

Contract is scheduled to be awarded at the regular scheduled meeting of the Georgetown City Council on December 13, 2010.

END OF BID PACKAGE

PROGRAM QUANTITIES

Crack Seal and Microsurfacing Project Listing

FY 2010-2011

Road Name	From	To	Length (ft)	Width (ft)	Area (yd^2)	PROPOSED TREATMENT
2ND ST	CLAYTON AVE	OLD LEMONS MILL RD	529	17	998	crack seal
AIRPORT RD	LEXINGTON RD	END	1366	26	3826	crack seal
AZTEC TRL	S PAWNEE TRL	SEMINOLE TRL	3712	23	9532	crack seal
BARRETT ST	HAWTHORNE DR	W SHOWALTER DR	1328	25	3687	crack seal
BEDFORD CT	KEELRIDGE DR	END	361	varies	681	crack seal
BERKSHIRE LN	ABERDINE WAY	JORDAN LN	1079	25	2997	crack seal
BETH CT	AZTEC TRL	END	437	23	1116	crack seal
BRADLEY ALY	N ROYAL SPRINGS AVE	KELLY AVE	345	10	383	crack seal
BRANDYWINE DR	QUALITY DR	DORCHESTER DR (END)	1900	25	5277	crack seal
BROOKSIDE DR	JOSIE TRL	END	1493	24	3980	crack seal
CHAMBERS AVE	E MAIN ST	E WASHINGTON ST	555	25	1541	crack seal
CLAY AVE	S BROADWAY	S HAMILTON ST	548	26	1583	crack seal
COMANCHE TRL	AZTEC TRL	POCAHONTAS TRL	942	23	2407	crack seal
COURT ALY	CLAYTON AVE	OLD LEMONS MILL RD	704	15	1173	crack seal
CREEKVIEW CT	FERN HILL DR	END	219	22	535	crack seal
DICKINSON CT	DICKINSON DR	END	152	25	422	crack seal
DICKINSON DR	W SHOWALTER DR	BARRETT ST	986	25	2738	crack seal
DICKINSON DR	BARRETT ST	END	219	25	608	crack seal
DORCHESTER DR	MONMOUTH CT	END (Near Brandywine Dr. end)	1094	24	2917	crack seal
E COLLEGE ST	S BROADWAY	S MULBERRY ST	849	36	3161	crack seal
E JACKSON ST	S BROADWAY	MILITARY ST	2497	24	7752	crack seal
EASTSIDE DR	PARIS PIKE	ROACH ST.	928	24	2474	crack seal
ELY AVE	W CLINTON ST	RUCKER AVE	666	15	936	crack seal
ESTILL CT	E JACKSON ST	CLAYTON AVE	871	24	2322	crack seal
FARNHAM AVE	S HAMILTON ST	ESTILL CT	260	23	664	crack seal
FAULKNER CIR	BROWNING DR	END	129	25	358	crack seal
FERN HILL DR	OLD MILL RD	END	452	24	1179	crack seal
FOX RUN RD	TIMBERWOOD TRCE	RABBIT RUN RD	1243	25	3346	crack seal
GREENBRIAR DR	MARKHAM DR	Apt. Entrance	200	24	533	crack seal
HAMMONS LN	HILL ST	W CLINTON ST	792	10	879	crack seal
HAWTHORNE CT	HAWTHORNE DR	END	162	25	450	crack seal
HAWTHORNE DR	S BROADWAY	HEMINGWAY PL	2162	varies	7092	crack seal
HIGHLAND AVE	N LEWIS CT	END (near N Lewis Ct.)	842	18	1681	crack seal
HILL ST	HIGHLAND AVE	KENTUCKY AVE	864	14	1366	crack seal
HOLLY LN	HILL ST	W CLINTON ST	755	10	838	crack seal
HOLLYHOCK LN	E JACKSON ST	CLAYTON AVE	865	18	1730	crack seal
HOOVER CT	E SHOWALTER DR	END	317	25	880	crack seal
INCA TRL	AZTEC TRL	POCAHONTAS TRL	702	24	1872	crack seal
JOHNSON AVE	POCAHONTAS TRL	END	423	26	1222	crack seal
KELLY AVE	W MAIN ST	QUAIL RUN DR (END)	605	18	1210	crack seal
LLOYD CT	SEMINOLE TRL	END	329	22	804	crack seal
LOUISA LN	ROXIE LN	WELLINGTON WAY	694	23	1773	crack seal
MAPLEWOOD DR	WELLINGTON WAY	ROXIE LN	779	24	2077	crack seal
MAPLEWOOD DR	MARY BOURNE DR	WELLINGTON WAY	646	23	1650	crack seal
MASON CT	SEMINOLE TRL	END	379	22	926	crack seal
MCFARLAND DR	W CLINTON ST	END	730	22	1784	crack seal
MELVILLE PL	BARRETT ST	END	454	25	1261	crack seal
MONTGOMERY AVE	W MAIN ST	END	1504	27	4451	crack seal
MORGAN MILL RD	DEGARIS MILL RD	KELSIE CT	1075	26	3094	crack seal
N BRADFORD LN	W SHOWALTER DR	END	514	30	1713	crack seal

PROGRAM QUANTITIES

Crack Seal and Microsurfacing Project Listing

FY 2010-2011

Road Name	From	To	Length (ft)	Width (ft)	Area (yd^2)	PROPOSED TREATMENT
N COLONIAL HEIGHTS DR	PORTSMOUTH DR	BAINBRIDGE DR	277	21	646	crack seal
N HAMILTON ST	E WASHINGTON ST	E JEFFERSON ST	351	35	1365	crack seal
N LEWIS CT	HIGHLAND AVE	CAUDILL AVE	262	24	698	crack seal
N MULBERRY ST	E MAIN ST	E WASHINGTON ST	600	21	1400	crack seal
N ROYAL SPRINGS AVE	W MAIN ST	END	358	17	675	crack seal
NATHANIEL CT	AZTEC TRL	END	280	20	622	crack seal
OLD LEMONS MILL CT	OLD LEMONS MILL RD	END	240	22	586	crack seal
OPERA ALY	S BROADWAY	S WATER ST	496	23	1267	crack seal
PORTSMOUTH DR	N LAFAYETTE DR	N COLONIAL HEIGHTS DR	407	21	949	crack seal
PRINCE GEORGE DR	S LAFAYETTE DR	S COLONIAL HEIGHTS DR	411	21	959	crack seal
PROSPECT ST	CHAMBERS AVE	MARKS ST	442	17	834	crack seal
ROBINSON AVE	E PENN AVE	END	445	22	1087	crack seal
RUCKER AVE	S BROADWAY	END	910	28	2830	crack seal
S MOHEGAN TRL	SEMINOLE TRL	HIAWATHA TRL	1206	21	2813	crack seal
S ROYAL SPRINGS AVE	W MAIN ST	END	1120	23	2860	crack seal
SAM POLLOCK DR	AIRPORT RD	MARSHALL PARK DR	1057	25	2936	crack seal
SEMINOLE TRL	GATEWOOD DR	ARAPAHO TRL	322	23	822	crack seal
SHAWNEE TRL	ARAPAHO TRL	MOJAVE TRL	696	22	1701	crack seal
SOUTH ALY	OAK ST	MAPLE ST	1179	varies	1681	crack seal
SPRINGSIDE AVE	HILLSIDE DR	BROOKSIDE DR	1043	26	3013	crack seal
TAYLORSVILLE TRL	DALE HOLLOW DR (END OF)	BARREN RIVER BLVD	1238	28	3851	crack seal
TORY CT	FAIRFAX WAY	END	214	24	570	crack seal
W CHOPIN WAY	SALINGER DR	BRADBURY LN	996	25	2766	crack seal
W CLINTON ST	KENTUCKY AVE	MCFARLAND DR	186	19	392	crack seal
W COLLEGE ST	S ROYAL SPRINGS AVE	KENTUCKY AVE	1520	23	4043	crack seal
W COLLEGE ST	S BROADWAY	S WATER ST	493	25	1369	crack seal
W JEFFERSON ST	N BROADWAY	N WATER ST	512	21	1306	crack seal
W PENN AVE	N BROADWAY	END	352	26	1016	crack seal
W SHOWALTER DR	BARRETT ST	BRADBURY LN	711	29	2291	crack seal
WALKER WAY	SEMINOLE TRL	AZTEC TRL	604	23	1543	crack seal
WANDA LEE TRL	ARAPAHO TRL	MOJAVE TRL	555	23	1418	crack seal
WAR ADMIRAL WAY	SECRETARIAT ST	CITATION CT	265	25	736	crack seal
WHIG CT	FAIRFAX WAY	END	634	24	1690	crack seal
AGINCOURT PL	GENERAL JOHN PAYNE BLVD	END	1731	varies	5112	Microsurface/Crack Seal pretreatment
CANEWOOD BLVD	FRANKFORT RD	GENERAL JOHN PAYNE BLVD	4256	varies	10032	Microsurface/Crack Seal pretreatment
GENERAL JOHN PAYNE BLVD	THE MASTERS	TURTLE POINT DR	5306	varies	14983	Microsurface/Crack Seal pretreatment
GLASS CIR	AGINCOURT PL	END	246	24	656	Microsurface/Crack Seal pretreatment
WARD CIR	AGINCOURT PL	END	374	26	1080	Microsurface/Crack Seal pretreatment
Total Area (SY)					192478	
Cracksealing (LB)					65904	
Microsurfacing (SY)					31863	



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BID FORM
2010-2011 Crack Sealing and Pilot Microsurfacing Program

BIDS DUE BY:
2:30 p.m. December 6, 2010
AT:
City Hall
100 N. Court Street
Georgetown, KY 40324

BID OPENING IMMEDIATELY FOLLOWING

PRIME CONTRACTOR: _____

ADDRESS: _____

SUB-CONTRACTOR: _____

ADDRESS: _____

Bid Item	Quantity	Unit Price	Subtotal
Crack Seal – various streets	65,904 LB	\$ / LB	\$
Microsurfacing – various streets	31,863 SY	\$ / SY	\$
Total Bid based on Program Quantities			\$

___ 5% Bid bond attached?

___ Contractor received and understands the Bid Package and Specifications.

PRIME CONTRACTOR SIGNATURE: _____

TITLE: _____

THIS FORM MUST BE COMPLETED AND RECEIVED IN THE CITY CLERK'S OFFICE



ROUTING, HEAT LANCING AND SEALING JOINTS/CRACKS

SCOPE OF WORK

It is intended that this work shall consist of routing, heat lancing, and sealing the existing transverse and longitudinal joints, cracks and random cracks in the concrete and bituminous surfaces with a hot applied modified asphalt polyester sealant.

The quantity shown for bidding purposes has been approximated. Actual payment for the work will be determined by field measurements of the work completed. Joints and cracks to be filled will be designated by the Inspection Engineer.

TRAFFIC CONTROL

All traffic control and protection including placement, removal, material, labor and devices shall be as needed to provide a safe work place and maintain quality work procedures according to KYTC traffic control standards.

ROUTING AND SEALING JOINTS/CRACKS

1.0: SCOPE OF WORK

This item shall consist of routing old sealants, dirt and incompressibles from joints and cracks. Cleaning, heat lancing, sealing joints and cracks in the pavement. This work shall include the proper routing, cleaning and heat lancing of all joints and cracks to be sealed. Furnishing and installing hot applied modified crack sealant in accordance with the materials specification in 2.0.

2.0: MATERIALS

2.1: GENERAL: All materials proposed for use shall be approved by the Inspector prior to the initiation of their construction. Contractor must provide a manufacturers data sheet for the product proposed to be used on the project.

2.2: HOT APPLIED MODIFIED CRACK SEALANT: The hot pour liquid crack sealant shall be a modified sealant and shall contain 5.0% +/- 1/2% polyester fibers by weight of asphalt components blended with high quality modified asphalt cement (recycled fibers are not permitted) meeting the following requirements. Specifications limits for hot applied modified asphalt sealant when heated in accordance with ASTM D5167 are as follows:

<u>Fiber</u>	<u>Properties</u>
Type	Polyester
Denier	3 to 5
Specific Gravity	1.38
Min. Melt Temp.	475 F
Tensile Strength	78,000 to 88,000 PSI
Elongation at Break	35 to 38%
<u>Modified Sealant Material</u>	<u>Properties</u>
Cone Penetration, 77F(ASTM D5329)	30 Max.
Safe Heating Temp.	400 F
Flexibility, 1", 90 bend, 10 sec.	Pass @ 0 F
Ductility, 77 F	10 cm min.
Softening Point	200 F
Asphalt Compatibility(ASTM D5329)	Pass

Storage, heating instructions and cautions will be supplied with each shipment. Sealant shall have an application life at application temperature up to 12 to 15 hours. A letter of certification stating the material complies with specification requirements shall be furnished with each shipment prior to sealing.

3.0: EQUIPMENT

3.1: GENERAL: All machines, tools and equipment used in the performance of work required by these specifications will be subject to the approval of the Inspector and maintained in a satisfactory and safe working condition at all times. The equipment shall be newer with the latest operation and safety technologies on board. Equipment will be subject to inspector approval. Contractor must provide a list of the type and age of equipment to be used on the project.

3.2: JOINT AND CRACK ROUTING MACHINE: The joint and crack routing machine shall be equal to the CRAFTCO MODEL 200 Joint and Crack Cleaner. The routing machine shall be portable and capable of routing existing asphalt and concrete surfaces along and adjacent to the joint and crack. The unit shall be capable of following random cracks. The unit shall have an adjustable depth control and be capable of cutting width modification. The machine shall be capable of cutting approximately 1,000 to 1,200 LF/Hour of cracks or joints with an experienced operator. Joints and cracks shall be routed to the 3/4" X 3/4" configuration.

3.3: **HEAT LANCE:** The heat lance shall be a LAB Model B or approved equal, capable of producing air temperature up to 2500°F. and constructed of stainless steel. Same shall be provided with separate valves to control propane, burner air, and lance air. The fuel and the burner air shall be mixed only at the point of combustion before leaving the burner tube. A separate air lance tube shall pass inside the burner chamber and be orificed to a maximum 1/4". At the fuel source, the propane shall be controlled by a high-pressure regulator to control fuel pressure from 5 PSI to 30 PSI and to prevent flashback. Burner BTU should range from 20,000 to 500,000 BTU. A wheel kit constructed to keep the unit at the proper height and angle from the pavement and to prevent debris from striking the operator should be used.

3.4: **MELTER APPLICATOR:** The melter applicator unit shall be a self contained diesel fired double boiler device with the transmittal of heat through a heat transfer oil having a minimum flash point of 600°F (315°C). It must be equipped with an on board automatic heat controlling device to permit the attainment of a predetermined temperature, then, maintain that temperature as long as required. The unit shall also have a means to vigorously and continuously agitate the sealant. The sealant shall be applied to the pavement at the proper temperature under pressure supplied by a positive displacement pump with a direct connecting pressure extruding device. The material pump shall be heat transfer oil jacketed or have a pump located at the bottom of the sealant vat heated indirectly by the heat transfer oil. The pump shall have sufficient pressure to displace designated sealant of a rate of at least three (3) gallons per minute.

4.0: CONSTRUCTION METHODS

4.1: **PREPARATION OF JOINTS AND CRACKS:** The joints and cracks shall be routed and cleaned to a minimum depth of 3/4" X 3/4" wide to create a 1 to 1 ratio reservoir for sealant. No sealer material shall be placed until the joints and cracks have been cleaned of all loose dirt and material using a minimum 125 PSI/100CFM compressor. Following the initial routing and cleaning operation all joints and cracks will be heat lanced to clean and remove moisture. Heat Lancing may be deemed unnecessary by the Inspector if pavement is sufficiently dry. The joints and cracks shall be inspected and approved by the Inspector prior to placing the sealer material. Final joint and crack cleaning and heat lancing will not proceed in advance of sealing by more than 1/8 mile, except as otherwise approved by the Inspector. Joints or cracks in concrete pavement less than 3/8" should not be routed. Joints or cracks in bituminous pavements less than 1/4" should not be routed. These joints and cracks shall be cleaned with a heat lance then sealed with a tight band 3" wide or less. Use sealant sparingly.

4.2: APPLICATION OF JOINT AND CRACK SEALING MATERIAL:

No sealer material shall be installed until joints and cracks to be sealed have been inspected and approved. The sealing material shall not be applied when the weather is foggy or when rain threatens. When the atmosphere or pavement temperature is below 40° F, a heat lance is to be used to warm the pavement just prior to sealing operations. The pavement surface will be clean and dry. The polymeric fiber asphalt sealant temperature, when applied, will be between 375° and 425° F. Joints and cracks in concrete surfaces shall be sealed with hot applied material as designated in Paragraph 2.2. The sealant shall be applied uniformly solid from bottom to top and shall be filled without formation of entrapped air or voids. The sealant shall not be heated to more than 20° F above the safe heating temperature. The safe heating temperature can be obtained from the manufacturer's shipping container. Sealing material should be used sparingly.

Many joints and cracks in concrete have weakened or spalled surfaces on the sides. The joint or crack shall be slightly overfilled then leveled to fill in the depressed area, creating a neat bandaid no more than 3" (1" on each side of joint) for surface strength and waterproofing.

Sealing on bituminous surfaces shall be the same as in concrete surfaces. The cracks shall be slightly overfilled with the excess sealant to be leveled to form a slight overband for surface strength and waterproofing.

Sealant is to be leveled or struck down with the use of a 3" disk attachment at the end of the wand applicator. The sealant band should be less than 1/8" (3mm) thick. If the Inspector deems a thinner band is necessary (ie; transverse joints or cracks) a high temperature rubber V shaped squeegee shall follow the 3" disk attachment, taking care not to make band more than 3" wide.

Where traffic may be likely to come in contact with the hot sealant before it cools, the contractor shall spray Glenzoi 20 Plus or Crafcro Detack or approved equal over hot sealant to prevent material pickup on vehicle tires. The application rate is approximately one gallon of Glenzoi/Detack to fifty gallons of sealant.

4.3: PAVEMENT CLEANING: Old material and other debris that result from cleaning and sealing cracks shall be picked up and disposed of prior to opening the pavement at the end of each work day. The Inspector may deem it appropriate to blow debris off to the side of the road.

SPECIFICATION FOR MICROSURFACING

1. DESCRIPTION. This work consists of constructing a cold-laid, polymer-modified, emulsified asphalt pavement course to fill ruts or provide an intermediate or surface course for existing pavements. The paving mixture is composed of a polymer-modified emulsified asphalt, crushed aggregate, mineral filler, water, and possibly other additives. Follow the requirements outlined in ASTM D 6372, *Standard Practice for Design, Testing, and Construction of Micro-Surfacing*, with modifications as found in this specification. Apply this material according to the lines, grades, and typical cross-sections in the plans or as established by the Engineer.

Unless otherwise noted, Section references herein are to the Kentucky Transportation Cabinet's *Standard Specifications for Road and Bridge Construction*. All applicable portions of the Department's *Standard Specifications* apply unless specifically modified herein. Contractor will perform all sampling / testing as applicable. Payment will be per the City's BID FORM. In the Kentucky Transportation Cabinet's *Standard Specifications for Road and Bridge Construction*, "Department" shall mean "City of Georgetown", and "Engineer", "Division of Materials", and all other references shall be "City Engineer".

2. MATERIALS AND EQUIPMENT.

2.1 Mineral Filler. Use Portland Cement, Type I, conforming to Section 801.

2.2 Aggregate. Provide 100-percent crushed aggregate conforming to Sections 804 and 805. Use polish-resistant coarse and fine aggregate conforming to Subsection 403.03.03 for a Type A mixture. Do not use mineral aggregates that are inherently porous, such as blast-furnace slag, expanded shale, porous limestone, and lightweight aggregates, in this mixture.

Contrary to ASTM D 6372, test sand equivalent according to AASHTO T 176, soundness according to Kentucky Method (KM) 64-610, and LA abrasion according to AASHTO T 96. Ensure all aggregates satisfy ASTM D 6372 for sand equivalent, soundness, and LA abrasion.

2.3 Water. Conform to Section 803.

2.4 Emulsified Asphalt. The polymer-modified emulsion will be manufactured by addition of polymer to a CSS-1h conforming to AASHTO M 208 except the milling or blending of polymer shall occur into the base asphalt or emulsifier solution prior to the emulsification process. The asphalt emulsion manufacturer shall certify that the emulsion contains a minimum of 3 percent polymer solids based on the mass of asphalt (asphalt residual) within the emulsion. In addition, ensure that the emulsified asphalt conforms to the following criteria:

<u>Test</u>	<u>Criteria</u>
Elastic Recovery at 77 °F (AASHTO T 301)	60 % (min)
Residue by Distillation (AASHTO T 59)	62 % (min)
Ductility at 77 °F (AASHTO T 51)	40 cm (min)
Softening Point (AASHTO T 53)	140 °F (min)
Submit the manufacturer's corresponding test results, to the City Engineer at least two weeks prior to initial shipment to the project.	

2.5 Mixing Equipment. Produce the mixture in a self-propelled, front-feed, continuous-loading machine equipped with a conveyer-belt aggregate-delivery system and an interconnected, positive-displacement, water-jacketed gear pump to accurately proportion the aggregate and asphalt emulsion. Locate the mineral filler feed so the proper amount of mineral filler is dropped on the aggregate before discharge into the pug mill. Provide a spray bar to completely pre-wet the aggregate dropping down to the pug mill with additive and water before the introduction of the asphalt emulsion. Provide a twin-shaft, continuous-flow, multi-blade pug mill that is a minimum of 49 in. long. Ensure that the blade size and side clearances meet the equipment manufacturer's recommendations. Introduce the emulsion within the first one-third of the mixer length to ensure proper mixing of all materials before exiting the pug mill.

Equip the machine with opposite-side driving stations to allow full control of the machine from either side. Equip the mixer with a remote, forward-speed control at the rear mixing platform so the rear operator can control the forward speed and level of mixture in the paving or rut box. Provide material control devices that are readily accessible and positioned so the amount of each material used can be determined at any time.

Equip the mixing machine with a water pressure system and nozzle-type spray bar to provide a water spray ahead of and outside the spreader box when required. Apply water at a rate that will dampen the surface but not create free-flowing water ahead of the spreader box.

Use truck-mounted machines with a conveyer-belt aggregate-delivery system and without the front-feed, continuous-loading feature on projects of less than 15,000 total yd² or on spot repairs.

2.6 Spreading Equipment. If a leveling or surface course is specified, apply the mixture uniformly by means of a conventional spreader box.

If a rut-fill course is specified, apply the mixture with a "V-shaped" rut-filling spreader box. Equip the rut-filling spreader box with a steel strike-off device.

Attach either type of a spreader box to the mixer, and equip it with paddles mounted on an adjustable shaft to continually agitate and distribute the materials throughout the box. Ensure that the equipment provides sufficient turbulence to prevent the mix from setting in the box or causing excessive build-up or lumps. To prevent loss of the mixture from

the box, attach flexible seals, front and rear, in contact with the road. Operate the spreading equipment in such a manner as to prevent the loss of the mixture on super-elevated curves.

For surface courses, attach a secondary strike-off device to the spreader. Use burlap drags or other drags, if necessary, to obtain the desired finish. Replace drags having excessive buildup.

2.7 Calibration Equipment. Supply all of the equipment, materials, and scales necessary to perform the calibration according to Section 3.5 of this note.

3. CONSTRUCTION.

3.1 Preparation and Proportioning of Mixture. Submit a complete mix design, prepared by an approved laboratory, to verify the compatibility of the aggregate, asphalt emulsion, mineral filler, and other additives. Make the mix design with the same materials that will be used on the project.

Ensure the mix design has a residual asphalt content, by dry weight of aggregate, of 7.0 to 8.5 percent for leveling and surface courses and 6.5 to 8.0 percent for rut-filling mixes. Also ensure the mixture contains no reclaimed materials and a mineral filler content between 0.25 and 2.0 percent by dry weight of aggregate.

In addition to the mix design information required by KM 64-421, provide the following (all percentages are based on the dry weight of aggregate):

- minimum and maximum percentage of water; and
- percentage of mix-set additives, if required.

Provide test results from an accredited laboratory that conform to Section 8 of ASTM D 6372.

Submit the mix design and ingredient materials to the City Engineer for verification according to Subsection 402.03 a minimum of two weeks prior to initial use for testing and approval.

3.2 Mixture Gradation. Conform to the Type II requirements from ASTM D 6372 for leveling and surface courses and Type III requirements from ASTM D 6372 for rut-fill courses.

3.3 Weather Limitations. In addition to the applicable requirements in ASTM D 6372, apply the mixture only when it is not raining. Between September 30 and May 1, do not apply the mixture if the existing pavement surface temperature is less than 50 °F.

3.4 Surface Preparation. Apply a tack coat conforming to Section 406 at a rate of 0.06 to 0.12 gal/yd².

3.5 Calibration. Before mix production, calibrate the mixing equipment in the presence of the Engineer. Generate documentation for the Engineer, including individual calibrations of each material at various settings. Perform a new calibration if there is any change in the mix design. Following calibration and adjustments for changes in the mix design, do not make any further calibration adjustments to the mixing equipment without the Engineer's approval.

3.6 Application. Apply the paving mixture in a manner to fill minor surface irregularities and achieve a uniform surface without causing skips, lumps, or tears.

If a rut-fill course is specified, apply enough material to fill the wheel paths without excess crowning (overfilling). An excess crown is defined as 1/8 in. after 24 h of traffic compaction. Apply rut-fill courses in widths from 5 to 6 ft for each wheel path. Provide a smooth, neat seam where two rut-fill passes meet. Restore the design profile of the pavement cross-section. Feather the edges of the rut-fill course to minimize the use of excess material.

If a leveling course is specified, apply the paving mixture at a rate of 14 ± 2 lb/yd². If a surface course is specified over a leveling or rut-fill course, apply the paving mixture at a rate of 18 ± 2 lb/yd². If a surface course only is specified, apply the paving mixture at a rate of 24 ± 2 lb/yd². For leveling and surface courses, provide a smooth, neat center seam with a maximum overlap of 2 in. where two passes meet. Immediately remove excess material from the ends of each run. Construct surface courses wide enough to cover the outside edges of rut-fill and leveling courses.

Use squeegees and lutes to spread the mixture in areas inaccessible to the spreader box and areas requiring hand-spreading. With the Engineer's approval, adjust the mix-set additive to provide a slower setting time if hand-spreading is needed. Do not adjust the water content or adjust the setting time. If hand-spreading, pour the mixture in a small windrow along one edge of the surface to be covered, and spread it uniformly by a hand squeegee or lute.

Repair areas of the micro-surfacing that are damaged by traffic, rain, or other causes during construction of the project.

3.7 Acceptance and Verification.

3.7.1 Proportion and Spread Rate. Maintain continuous control of the emulsified asphalt-to-dry aggregate proportion to conform to the approved mix design within a tolerance of ± 2 gal/ton. Ensure the spread rate satisfies the specified quantity of aggregate per square yard on a dry-weight basis.

The City will base acceptance of the emulsified asphalt-to-dry aggregate proportion and the spread rate on the Engineer's summary of daily quantities. The City will accept a

day's application of micro-surfacing provided the Engineer's summary indicates conformance with the requirements for proportion and spread rate.

3.7.2 Emulsified Asphalt. Submit the manufacturer's test results, to the City Engineer at a frequency of one per day of production.

3.7.3 Mixture Gradation. Perform combined-gradation determinations on the aggregates used in the micro-surfacing at a frequency of one per day of production. The City will allow the tested gradation to vary within the tolerances given in ASTM D 6372 provided the percent passing any sieve remains within the master gradation limits from ASTM D 6372.

4. MEASUREMENT. The City will pay for surface and leveling micro-surfacing courses by the number of square yards, complete and accepted in place.

The City will base the width of the pavement course on the width shown on the plans or as directed by the Engineer. The City will measure the length along the centerline of each roadway.

The City will not measure the surface preparation or tack coat for payment and will consider them incidental to the micro-surfacing.

5. PAYMENT. The City will consider the unit bid price per square yard to include all labor, materials, and equipment necessary to complete the work. The City will make payment for the completed and accepted quantities according to the following:

<u>Code</u>	<u>Pay Item</u>	<u>Pay Unit</u>
-----	Microsurfacing, surface course	Square Yard
	Microsurfacing, leveling course	Square Yard

November 9, 2010

End of specification